DOCUMENT RESUME

ED 456 810 IR 020 845

AUTHOR Lai, Su-Huei
TITLE Principles and Suggestions for Developing Effective Web-Based Lessons.
PUB DATE 2000-09-00
NOTE 7p.; Paper presented at the Annual International Conference of the Chinese American Educational Research and Development Association (8th, Jamaica, NY, September 16-17, 2000).
PUB TYPE Opinion Papers (120) -- Speeches/Meeting Papers (150)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Computer Uses in Education; Educational Technology; Higher Education; *Instructional Design; *Instructional Development; Instructional Effectiveness; *World Wide Web Technology Implementation; *Web Based Instruction

ABSTRACT

This paper presents and discusses the following principles for planning, implementing, and evaluating World Wide Web-based lessons: (1) the roles of the teacher and students should be identified; (2) the nature of related contextual factors should be clarified before the planning session; (3) although the delivered content may differ in its degree of structural format, student participation should be exploratory rather than structured; (4) the teacher's attitudes should be supportive and open-ended; (5) in order to inspire learners to focus on the Web-based lessons and the related content, attractive multimedia and bizarre word expression may be frequently used, but not abused; (6) convergent or divergent techniques should be appropriately applied in the inquiry if the techniques are suitable for the nature of the subject matter; (7) ensure a good Web page design for Web-based lessons in order to promote effective learning by providing choices, saving time, retaining patience, and motivating automatic processes; and (8) alternative assessment is needed throughout each stage of planning, implementing, and evaluating of the teaching and learning process. (Contains 20 references.) (MES)

Reproductions supplied by EDRS are the best that can be made
from the original document.

S. Lai

Principles and Suggestions for Developing Effective Web-based Lessons

Su-Huei Lai, Ph.D
Femsys Consulting, Inc. http://www.FEMsys.com

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

2B

ED 456 810

Introduction

Although increased demands of using technology in education have been addressed by many educators, discussion on the principles of effective Web-based lessons seems to be lagging. For example, some educators stressed technology integration or applications for higher education (Brown, 1998; Levin & Buell, 1999; Wtzel, Zambo, & Buss, 2000). Some focused on the strategies or utilization of Internet in teaching and learning (Lai, 1999; Maddux, 1999; Yuan, 1999; Falk, Rehman, & Mba, 1999; Yuan, 2000). Others either concentrated on the research related to distant learning or examined the effectiveness of technology on students' learning (Daigjertu & Funke, 1998; Szabo & Kanuka, 1998; Falk, 1999; Roblyer, 1999; Harnar, Brown & Mayal, 2000). However, as Ray (1999) pointed out, educators might discover that the software used in the research had disappeared from the market by the time the research findings were published. It provokes the thinking regarding a set of principles that facilitate the effective use of technology is needed.

Recently, many educators suggested the applications of constructivism in Internet teaching and learning (Brown, 1998; Ewing, Dowling, & Coutts, 1998; Rogers, 2000; Barker, 2000; Harnar, Brown & Mayal, 2000). However, without elaborating and articulating the concepts, conducting effective Internet teaching and learning still remains challenging for many educators. The word, "effectiveness" is more likely resulted from efficient settings. But approaching efficiency concerns prescribed principles, which may make positive contributions to the settings while appropriately used. For attaining these principles, the author re-examined the constructivists' notion, Piaget's thinking, and recent researching results. Articulating the author's findings from a quantitative study (lai, 2000), a set of tentative principles was proposed based on the emancipating mode of problem solving action (Lai, 2000). These principles may be dynamically needed in each stage of planing, implementing, and evaluating of a Web-based lesson.

Principles for Developing Effective Web-based Lessons

Principle 1. The roles of the teacher and students should be identified. The teacher may perform multiple roles such as an organizer of the learner, an initiator of group activities, a reflector of learner's thinking, and an assessor of students' learning process. The role of the student is an active, self-directive, self-regulated, and self-discovering one (Joyce & Weil, 1992; Brown, 1998; Barker, 2000).

Principle 2. The nature of related contextual factors should be clarified before the planning session. For example, the teacher must be very clear about the nature of the

IR020845

BEST COPY AVAILABLE

equipment on the both sides of the teacher and students, the nature of subject matter and its related URLs, and the nature of the students as well as its related Internet and real-world communities. For example, a step by step and structural content may be better for novice undergraduate students who are learning basic technical courses such as entry-level computer programming, engineering, and statistic courses. However, an exploratory mode of inquiry may be needed for experienced students who are learning methods and theories in the field of Arts, Humanities, and Social sciences. A technical person may prefer a straightforward method whereas the interpretive mode of problem solver tends to seek meaning and explanation from others (Lai, 2000). Thus, the degree of the structural or exploratory Internet teaching format must be determined by the nature of equipment, students, and subject matter. Furthermore, the teacher must constantly examine those collected URLs that provide related content in the course. The decision on the design must maintain open-ended.

Principle 3. Although the delivered content may differ in its degree of structural format, "student participation should be exploratory rather than structured." Thus, proposed "activities must be student centered rather than teacher centered" with collaboration in a small group. In addition, proposed problems "should have values in the real world, not just in the classroom" (Brown, 1998, p. 29).

Principle 4. Teacher's attitudes should be supportive and open-ended. Such attitudes bring about rapport climate, belonging feeling, comfortable feeling and sharing willingness among students and the teacher and result in successful learning experience (Harnar, Brown, & Mayall, 2000).

Principle 5. In order to inspire learners to focus on the Web-based lessons and the related content, attractive multimedia and bizarre word expression may be frequently used, but not abused. With Multimedia/CD, which is capable of presenting sound, graphic, and animation effects, the presentation becomes vivid and therefore enhances learning. However, if the unreliability and inconsistency of information transfer via Internet connections (Diaz, 1998) occur due to the limitation of CPU memory or lack of Cable Moderm at students' home sites, they may lose their patience and be distracted by the other objects. For example, the author observed a case in the Internet news report session. When the viewer found that the female's voice turned into male's and the animation stopped in the middle of the session, he clicked the other URL to explore something else. Another example showed the similar situation. When the viewer found that the voice could not match the picture. He immediately went to the other home page. With bizarre words or expression, the presentation brings about curiosity, which motivates students to access the learning mode. For example, instead of posting the message title as "The Definition of Democracy" on a message board, the teacher introduced the concept of democracy by posting "OUCH! Such a war." Students tended to access to the later message rather than the former one. However, such expression should be creative and altered frequently. If the same expression is overused, it might lose attraction (Lai, 2000).

Principle 6. Convergent or divergent techniques should be appropriately applied in the inquiry if the techniques are suitable for the nature of the subject matter. The convergent technique refers to the teacher's confirmation on a consensus concept or theory that is formulated by the majority of diverse students. Such a concept or theory is congruent to the intended teaching content. On a message board, for example, students may propose a similar way to solve a problem that was initiated by one of the students or the teacher. If this consensus problem solving method or theory happens to be one of the planned contents, the instructor then reflects their thought and pro-presents the theory. At this point, the instructor has to be very careful to use his/her appropriate words on the confirmation of the theory. For example, the instructor may respond: " Hi! Mary, Mike, Lily, and Nancy! Are you saying that '…' I know there was a famous educator who had the similar thought like what you folks have." Upon students' curiosity, the instructor would have a good chance to present his/her designed content. The divergent technique refers to accepting the different problem solving methods that are proposed by diverse individuals in a group. In this case, the instructor reflects each alternative thought with "acceptant" manners. Acceptance does not mean agreement or disagreement. For example, the instructor, Mendy, intends to introduce the concept of "Dewey's democracy." After reading Mary, Mike and Lily' message, she may reply: "To my knowledge, Mike means democracy is '…'; Mary thinks democracy is '…'; Lily explains democracy is '…'. What did John Dewey think about democracy? He believes that the democracy is '…'. You can look at the following URLs." In so doing, without subjective judgment which might deny students' creative thinking, the teacher accepts students' alternatives and also presents his/her alternatives in which instructional content is engaged (Lai, 2000). This principle enhances students' learning while processing "assimilation", "accommodation", and "equilibration" in terms of Piaget's notion (Pillips & Soltis, 1985; Joyce & Weil, 1992; Ewing, Dowling, & Coutts, 1998).

Principle 7. Ensure a good web page design for Web-based lessons in order to promote effective learning by providing choices, saving time, retaining patience, and motivating automatic processes. Azabo & Kanuka (1998) conducted an experimental research and concluded that "Viewing good screen designs promotes automatic processing whereas viewing poor screen designs encourages a manual and therefore less efficient processing" (p. 38).

Principle 8. Alternative assessment is needed throughout each stage of planning, implementing, and evaluating of the teaching and learning process. Teachers can apply both quantitative and qualitative methods. However, when it is the time to explain the results and findings, the emancipating mode of problem-solving action may be needed (Lai, 2000). For example, using the quantitative method, one may raise some questions regarding using a form-filled survey to collect data. For example, what will be the validity and reliability of the instrument? Does the instrument measure the person who is supposed to be measured? Is the computer program set to detect the duplicated cases? In addition, in the ICQ-like mode, is it appropriate to assess international students on any subject while not using their native languages?

Suggestions

On the way toward developing effective Web-based lessons, there may be more research efforts needed for polishing these principles along with the on-going changing technology. As the author mentioned in a previous paragraph, this is a set of tentative principles. Each of these principles requires critical thinking and practical reasoning to examine and re-examine their effects on students' learning from the Web-based courses.

References

Barker, P. (2000). Internet-Based Learning- An introduction and business. Edited by D. French, C. Hale, C. Johnson and G. Farr. Book Review, Spring/Summer 2000.

Brown (1998). Distance education and Web-based training. ERIC Clearinghouse on Adult, Career, and Vocational Education Center on Education Training for Employment, College of Education, The Ohio State University.

Daugherty, M. & Funke, B. L. (1998). University faculty and student perceptions of Web-based instruction. Journal of Distance Education. 13(1), 21-39.

Ewing, J.M. Dowling, J.D. & Coutts, N. (1998). Learning using the World Wide Web: A collaborative learning event. Journal of Educational Multimedia and Hypermedia. 8 (1). 3-32.

Falk, L. Rehman, S. & Foster, D. (1999). Distance learning and the web: Are advertising programs missing the target? Int'l J of Instructional Media, 26(1), 23-29.

Harnar, M. A. Brown, S. W. & Mayall,H. J. (2000). Measuring the effect of distance education on the learning experience: Teaching accounting via PICTURETEL. Int'l J of Instructional Media, 27(1), 37-49.

Joyce, B. & Weil, M. (1992). Models of teaching. (4th ed.). New Jersey: Englewood.

Lai, S.H. (1999). Teaching with Internet: Strategies for innovative instructional models. Paper presented at The Seventh Annual International Conference of Chinese American Educational Research and Development Association. October, 30-31, 1999, Fairfax, Virginia.

Lai, S. H. (2000). Contribution of Internet utilization to teaching and learning in families: A report of qualitative research results. Paper was presented in the Ohio Chinese American Professional Association Symposium 2000, May 27-28, 2000, Athens, Ohio.

Lai, S.H. (2000). Conceptual framework of modes of problem solving action (MPSA): Implications for Internet teaching and learning. The Eighth Annual International Conference Proceedings of Chinese American Educational Research and Development Association (pp.165-170). September, 16-17, 2000, Jamaica, New York.

Levin, S. R. & Buell, J. G. (1999). Merging technology into teacher education: Technology tools and faculty collaboration. Journal of Computing in Teacher Education. 16(1), 7-14.

Maddux, C. D. (1999). The Web: Can we make it easier to find information? Computers in the Schools, 15(2), 5-9.

Phililips, D.C. & Soltis, J. F. (1985). Perspectives on learning. New York: Teachers College Press.

Ray, L. (1999). Multimedia authoring tools: Challenges to effective use. Educational Computing in the School, 15(1), 79-87.

Roblyer, M. D. (1999), Is choice important in distance learning? A study of student motives for taking Internet-based courses at the high school and community college levels. Journal of Research on Computing in Education, 32 (1), 157-171.

Rogers, D. L. (2000). A paradigm shift: Technology Integration for higher education in the new millennium. Educational Technology Review. 13, 19-27.

Ron Zambo &Buss, R.R. (2000). Professional development for transformative teaching with technology in K-8 classrooms. Journal of Computing in Teacher Education. 16(2), 16-20.

Szabo, M. & Kanuka, H. (1998). Effects of violating screen design principles of balance, Unity, and focus on recall learning, study time, and completion rates. Jounal of Educational Multimedia and Hypermedia, 8(1), 3-22.

Yuan, S. C. (1999). The Internet and its uses in education. The Seventh Annual International Conference Proceedings of Chinese American Educational Research and Development Association. October, 30-31, 1999, Fairfax, Virginia.

Yuan, S. C. (1999). The Internet: Global resources for teaching and learning. New Waves-Educational Research & Deverlopment, 4 (3). 16-23.

Lai, S.H. (2000). Principles and suggestions for developing effective Web-based lessons. The Eighth Annual International Conference Proceedings of Chinese American Educational Research and Development Association (pp.21-25). September, 16-17, 2000, Jamaica, New York.